Art. XI.—*Miscellaneous Notes on some New Zealand* Crustacea.

By Charles Chilton, M.A., M.B., D.Sc., F.L.S., Professor of Biology, Canterbury College, University of New Zealand.

[*Read before the Philosophical Institute of Canterbury, 6th September, 1911.*]

This short paper contains a few miscellaneous notes that have been made during recent years on some New Zealand *Crustacea*. Though there are many other questions that require to be settled, and several groups that need thorough revision, it has been thought worth while publishing these few notes as they stand, though they are necessarily somewhat disconnected, and deal with scattered members of the *Crustacea*.

Order Decapoda.

Hymenosoma lacustris Chilton.

Elamena (?) *lacustris* Chilton, Trans. N.Z. Inst., vol. 14, p. 172, pl. 8, 1882. *Hymenosoma lacustris* Chilton, Trans. N.Z. Inst., vol. 15, p. 69, 1883; Fulton and Grant, Proc. Roy. Soc. Victoria, vol. 15, p. 59, pl. 8, 1902; Chilton, P.Z.S. for 1906, p. 703, 1906.

This small fresh-water crab was originally described from Lake Takapuna (or "Pupuke"), near Auckland, which is quite near the sea-coast, and for a long time this was the only locality from which it was known, and it was a little uncertain whether it was a genuine fresh-water form or a relict species that had only comparatively recently developed in Lake Takapuna. In 1902, however, Messrs. Fulton and Grant recorded the species from Lake Colac, in Victoria, and about the same time I received several specimens from Norfolk Island. Specimens from all these localities were examined by Messrs. Fulton and Grant, and, although there are a few slight differences, these were found to be not constant, and they decided to consider all the forms as belonging to the one species.

In 1903 two specimens of the crab were found by Messrs. Hodgkin and Lucas in Lake Waikare, in Auckland, which is a considerable distance from the coast; and in the early part of this year (1911) a few specimens undoubtedly belonging to the same species were sent to me by Mr. Cheeseman from the Waipa River.

It seems evident from the above facts that the species is a widely distributed inhabitant of fresh waters, and its occurrence in the fresh waters of New Zealand, Norfolk Island, and Victoria presents a problem of some interest in connection with the geographical distribution of the *Crustacea*. In connection with this point, it is, however, worth while stating that the fresh-water shrimp in Norfolk Island and Victoria is *Xiphocaris compressa* De Haan, and is quite different from the species, *X. curvirostris* Heller, which is found in nearly all the fresh-water streams of New Zealand, and occurs also in the Chatham Islands.

Munida gracilis Henderson.

Munida gracilis Henderson, Ann. Mag. Nat. Hist., ser. 5, vol. 16, p. 411, 1885; and "Challenger" Reports, vol. 27, p. 143, pl. 3, fig. 6, 1888.

Three imperfect specimens found in the stomach of a fish, Kaikoura. These agree very closely with Henderson's descriptions, but they are of much larger size. One of them, a female bearing eggs, has the following dimensions: Length of body, 54 mm.; breadth of carapace, 16 mm.; length of carapace, 19 mm.; length of rostrum, 13 mm.; length of chelipeds, 70 mm.

Two specimens were taken by the "Challenger" at Station 166, west of New Zealand, at a depth of 275 fathoms, but so far as I am aware the species has not been seen since until the specimens now described were handed over to me by Mr. Waite, Curator of the Canterbury Museum.

Cryptodromia lateralis Gray.

Cryptodromia lateralis Miers, Cat. N.Z. Crust., p. 57, 1876; G. M. Thomson, Trans. N.Z. Inst., vol. 31, p. 170, pl. 20, figs. 1 and 2, 1898; Hutton, N.Z. Journ. Sci., vol. 1, p. 264, 1882.

This species was recorded from New Zealand by Heller, and specimens in the British Museum collections were referred to it with some doubt by Miers when he was preparing the "Catalogue of the New Zealand Crustacea." In 1882 Hutton included it in a list of species which had been recorded from New Zealand, and might really belong to New Zealand, although at the time he wrote they were not represented in any local collections known to him. This was still the case when Thomson prepared his "Revision of the Crustacea Anomura," in 1897. Two or three years ago, however, I received from Captain Bollons a specimen, dredged in Hauraki Gulf at a depth of 22 fathoms, that undoubtedly belongs to this species, so that, like some of the other species first recorded from New Zealand by Heller, and since considered doubtful, it is found in New Zealand seas, though, apparently, only occasionally. The species is also known from Australia and Tasmania.

Order AMPHIPODA.

Leucothoe traillii G. M. Thomson.

Leucothoe traillii G. M. Thomson, Trans. N.Z. Inst., vol. 14, p. 234, pl. 18, fig. 1 *a–d*, 1882; Stebbing, Das Tierreich Amphip., p. 164, 1906. *L. tridens*, Stebbing, Rep. Voy. "Challenger," vol. 29, p. 777, pl. 47, 1888; Chilton, Trans. N.Z. Inst., vol. 38, p. 268, 1905; Stebbing, Das Tierreich Amphip., p. 166, 1906.

I have no doubt these two species should be combined. I had identified specimens from Hauraki Gulf as *L. tridens* Stebbing, but I find that they are the same as a Lyttelton specimen that I had years ago referred to *L. traillii* G. M. Thomson, and I find from comparison of these with named specimens of this species since received from Mr. Thomson that no difference can be detected between them. Mr. Thomson describes the dactyl of the first gnathopod as being "finely serrated on its inner margin," but in all my specimens it appears quite smooth. In Mr. Thomson's mounted specimen the dactyl lies close up against the propod.

and its inner margin cannot be clearly seen, but it appears smooth there also. In his original description Stebbing describes the telson as having "the minute apex microscopically tridentate," and figures it as distinctly tridentate; in the "Das Tierreich" description he simply says, "apex a little obtuse," which perhaps more accurately describes the appearance of the telson in those specimens that I have examined.

Hab.—Hauraki Gulf (25 fathoms), Paterson Inlet (10 fathoms). Taken also in New Zealand seas by the "Challenger" (2,000 fathoms).

Pontogeneia danai (G. M. Thomson).

Atylus dania, *A. danai* G. M. Thomson, Trans. N.Z. Inst., vol. 11, pp. 238. 248, pl. 10F, fig. 1, 1879. *Pontogeneia danai* Stebbing, Das Tierreich Amphip., p. 360, 1906. *Atylus lippus* Haswell, Proc. Linn. Soc. N.S.W., vol. 4, p. 328, pl. 20, fig. 1, 1880, and Cat. Aust. Crust., p. 243, 1882; Chilton, Proc. Linn. Soc. N.S.W., vol. 9, p. 1037, 1885. *Eusiroides lippus* Stebbing, Das Tierreich Amphip., p. 346, 1906; Stebbing, Results "Thetis" Exped., Memoir Aust. Mus., vol. 4, p. 639, 1910.

Lyttelton, Akaroa, Dunedin (G. M. Thomson), Bluff (L. Cockayne), Stewart Island (H. B. Kirk). Also Port Jackson, New South Wales, and Portland, Victoria.

Very common in rock-pools; colour very variable.

Closely allied to *P. antarctica* Chevreux, from which it differs in having every 4th (or 5th) segment of flagellum of antennules dilated and the dilatation more prominent.

Atylus lippus Haswell is put down by Stebbing as an obscure species of *Eusiroides*. I have, however, several specimens from Sydney Harbour and other places in Australia which seem undoubtedly to belong to Haswell's species, and they certainly should be placed under *Pontogeneia*, and a comparison of them with New Zealand specimens shows that they are the same as *P. danai* G. M. Thomson, a species described a year earlier.

Paraleptamphopus subterraneus (Chilton).

Paraleptamphopus subterraneus (Chilton), Trans. N.Z. Inst., vol. 41, p. 54 (with synonomy).

In the paper quoted above I gave the localities from which the species had been found up to that time. Shortly afterwards, on the 24th December, 1908, I took it among moss, &c., in a small mountain-stream at Duck Cove, Dusky Sound. The specimens were perhaps slightly yellower than those found underground, but showed no sign of eyes, and in all other respects seem quite the same as those first found in the underground waters of the Canterbury Plains.

In January, 1911, Mr. W. F. Howlett sent me specimens from Eketahuna, which had been obtained from a well in the same way as those originally got from the Canterbury Plains. The only previous record from the North Island had been one specimen obtained in Lake Taupo, at a depth of 700 ft., by Messrs. Hodgkin and Lucas.

It is evident that this species is even now widely distributed throughout New Zealand, usually inhabiting underground waters, but occasionally found also in surface streams.

Elasmopus viridis (Haswell).

Moera viridis Haswell, Proc. Linn. Soc. N.S.W., vol. 4, p. 333, pl. 21, fig 1, 1879. *M. incerta* Chilton, Trans. N.Z. Inst., vol. 15, p. 83, pl. 3, fig. 3, 1883. *Elasmopus viridis* Stebbing, Das Tierreich Amphip., p. 445, 1906.

Several specimens from Island Bay, Wellington (Farquhar coll.), were in Mr. G. M. Thomson's collection. The species is known from Australia also.

When I described this species under the name *Moera incerta* I had seen only specimens in which the second gnathopod had the palm straight —*i.e.*, the females. Since then I have seen a few in which the palm has a slight central cavity, as described by Haswell and Stebbing, though the cavity is by no means so deep as that shown in Haswell's figures; I think, therefore, that Stebbing is right in uniting the two species. These specimens, are, I presume, males, and it is worthy of note that in this species the females have the second gnathopods approximately as large as those in the males, and, with the exception of the palm, of the same general shape.

Phronima novae-zealandiae Powell.

Phronima novae-zealandiae Hutton, Index Faunae N.Z., p. 256, 1904.

This is a common pelagic form often washed up on the sandy beaches of New Zealand. In June, 1911, two specimens were found at Sumner, where Powell's type specimens were captured, and were sent on to me by Professor Park, of Dunedin. In March, Mr. C. Barham Morris, of Oamaru, sent me a mounted slide of a small *Phronima* taken at Tomahawk Beach, Dunedin. This specimen appeared to be identical with the one referred to *P. pacifica* Streets by Stebbing in the "Challenger" Reports (p. 1350). As *P. pacifica* had not been previously recorded from New Zealand, I wrote to Mr. Morris asking if he had further specimens, and in reply was informed that the small specimens were taken along with ordinary large specimens which he considered to be *P. novae-zealandiae*.

I find from the examination of one of the large specimens kindly forwarded by him that this identification is quite correct, and it appears almost certain, therefore, that the small specimens taken at the same time are simply immature forms of *P. novae-zealandiae*. Most of them measure about 4 mm. in length. The "Challenger" specimen, which was taken in the Atlantic Ocean, off Sierra Leone, was "$\frac{3}{10}$ in." in length, and was therefore probably an immature form also.

P. pacifica was originally described by Streets from the North Pacific Ocean, and was said to be distinguished from *P. sedentaria* by the broadly quadrate form of the carpus of the third pair of thoracic feet and by having the carpus of the second gnathopods less produced anteriorly. It was also pointed out that there was a striking resemblance of the smaller specimens of *P. pacifica* and the corresponding parts of *P. atlantica*, which is said to be the female of *P. sedentaria*. It appears, then, that there is some suspicion that *P. pacifica* is not a distinct species, but perhaps an immature stage.

Unfortunately, I am unable to consult all the literature necessary on this point, but the forms I have seen undoubtedly seem to be the young of *P. novae-zealandiae*, and if not identical with *P. pacifica* are extremely

close to it. This seems to make it more probable that *P. novae-zealandiae* is identical with *P. sedentaria*, as was suggested by Stebbing in the "Challenger" Report.

Order Isopoda.

Iais pubescens (Dana) var. longistylis var. nov.

This variety differs from the typical form of the species in the longer uropods, which are fully half as long as the pleon; the peduncle is shorter than the rami, and may be slightly dilated at the distal end; the outer ramus is almost or quite as long as the inner, but slightly more slender, and has long setae, usually at the end only; the inner ramus has long setae both at the end and at a point some distance from the end.

Hab.—On *Sphaeroma quoyana*, Marlborough Sounds and Hawke's Bay. Also on specimens of the same species from Sydney Harbour.

I have had specimens of this variety for several years. The difference between it and the typical form of the species is sometimes so distinct that I have at times almost been inclined to give it a different specific name, especially as it appears to be always associated with a different species of *Sphaeroma*. I find, however, that *Iais pubescens* found on *Sphaeroma gigas* shows considerable variation in the length of the uropods; I have one specimen from Lyttelton which has them much longer than usual, and approaching the condition found in the variety now described, while others from Port Chalmers have the uropods much shorter, with the outer ramus very small and only about half as long as the inner one. I can, moreover, find no constant points of difference except in the uropoda, and therefore prefer to look upon the form found on *S. quoyana* as merely a variety of the species.

Haliacris neozelanica (Chilton).

Munna neozelanica Chilton, Ann. & Mag. Nat. Hist., ser. 6, vol. 9, p. 1, pl. 1 and 2, 1892. *Haliacris neozelanica* Chilton, Subant. Islands N.Z., p. 650, 1909.

A number of specimens that appear to belong to this species were taken at Waikawa Bay, in Queen Charlotte Sound, near Picton, in July, 1910. They were found in considerable numbers creeping on the under-surface of stones in a fresh-water stream at a point a little above high-water mark, the water at that place being at the time quite fresh, though it would be probably more or less influenced by high tides. The animals were all very small, and I have not been able to find one having the characteristic development of the first pair of legs of the adult male; but, so far as can be seen, the specimens are not structurally different from those gathered at the type locality in Port Chalmers, though they have the body rather darker in colour.

One similar specimen was also taken at Portage, on Kenepuru Sound, also at the mouth of a small stream, and in both cases specimens of *Phreatogammarus propinquus* were taken at the same time and place. Many years ago I collected one or two specimens in a similar situation at Waitati Estuary, Otago, but they were so minute that an exact identification at the time was impossible.

Structurally these fresh-water or brackish-water specimens do not seem to differ from the typically marine form, but there seems not much

doubt that they do differ considerably in habit, and perhaps should be looked upon as a special variety. All the specimens found were quite small, not more than 2 mm. in length, and it is, of course, possible that only the young stage is passed through in the stream, and that as the animals become older they take to the sea.

Jaeropsis curvicornis (Nicolet).

Jaera curvicornis Nicolet in Gay's Hist. fis. y pol. de Chile, vol. 3, p. 263, pl. 3, fig. 10, 1849. *Jaeropsis neo-zelanica* Chilton, Trans. N.Z. Inst., vol. 24, p. 267, 1892. *J. curvicornis* H. Richardson, Trans. Connect. Acad. Sci., vol. 11, p. 298, 1902; Stebbing, Ceylon Pearl Fisheries Report, pt. 4, p. 51, pl. 11 (*c*). 1905. *J. patagoniensis* H. Richardson, Proc. U.S. Nat. Mus., vol. 36, p. 421 (with figure), 1909.

I have specimens of this species from Akaroa, Taylor's Mistake, and Lyall Bay. The colour seems somewhat variable, the dorsal surface being a light brown and legs whitish; in one specimen, however, the brown colour was present only on the posterior part of the head and the first four segments of the paraeon, the remainder of the dorsal surface being whitish. The Akaroa specimen, which I described in 1892 under the name *Jaeropsis neo-zelanica*, is a very small one, only about 2 mm. in length; one of the specimens from Taylor's Mistake is considerably larger, being 5 mm. in length, and comparison of this, which I have no doubt belongs to the same species as the Akaroa and other specimens, enables me to give some points in which the larger and presumably adult specimen differs from the small immature ones. In the larger specimen the flagellum of the antennae is considerably longer than in the other specimens, and consists of about twelve joints, the first one being much the largest, as long as the remainder together, and being broadly expanded. In this specimen, too, the sides of the pleon are smooth, except for a small tooth about a third the length from the posterior end. In small specimens the sides of the pleon are somewhat serrated, the last serration, which corresponds with the one still present in the older specimen, being slightly the most prominent.

All the species of this genus appear very closely similar, and from what has been said above it seems probable that some of them have been established on small and possibly immature specimens. I think Mr. Stebbing is right in uniting *J. neo-zelanica* with *J. curvicornis* (Nicolet), and the specimens which he describes from the Gulf of Manaar certainly seem to be close enough to be placed under this species. I have no doubt also that the specimens more recently described by Miss H. Richardson under the name *J. patagoniensis* also belong here, the pleon agreeing closely with that of my larger specimen; the other points she mentions, as regards colour, &c., are hardly of specific importance; the lobe at the front of the head is described and figured by her as having a small point in the centre, while in my specimens it is rounded in front. Nicolet draws his specimens with this lobe slightly concave in front, and, in any case, the difference appears to be very trifling. *J. marionis* Miers, taken by the "Challenger" off Marion Island, seems to be pretty closely allied, but, as represented by Miers, has the joints of the antennae much less expanded, and the uropoda are perhaps rather different in structure.

Sphaeroma quoyana Milne-Edwards.

Sphaeroma quoyana Milne-Edwards, Hist. Nat. des Crust., vol. III, p. 206, 1840; Heller, Reise der Novara, Crust. p. 137, 1868; Haswell, Cat. Aust. Crust., p. 287, 1882; Hedley, Rep. Aust. Assoc., vol. 8, p. 239, pl. 10, fig. 1, 1901. *S. verrucauda* White, List Crust. Brit. Mus., p. 102 (*sine descr.*), 1847; Dana, U.S. Explor. Exped., vol. 14, Crust., pt. 2, p. 779, pl. 52, fig. 6, 1853; Miers, Cat. N.Z. Crust., p. 111, 1876; Haswell, Cat. Aust. Crust., p. 288, 1882; Hutton, Index Faunae N.Z., p. 263, 1904; Stebbing, Spolia Zeylanica, vol. 11, pt. 5, p. 21, 1904; Hansen, Q. J. Micro. Soc., vol. 49, pt. 1, p. 116, 1905; Hedley, Rep. Aust. Assoc., vol. 8, p. 239, 1901.

Sphaeroma quoyana was described by Milne-Edwards in 1840 from Australian specimens, but nothing appears to have been recorded by him about its boring habits. Haswell had not seen the species when preparing the "Catalogue of the Australian Crustacea."

In 1853 Dana described a species under the name of *S. verrucauda*, from the Bay of Islands, New Zealand, his specimens having been found "in rotten wood in cavities bored by *Teredo*." Miers, in his "Catalogue of the New Zealand Crustacea," in 1876, records the species from "Auckland, Hobson's Bay," and notes that these specimens inhabited "similar cavities in a piece of sandstone." He also mentioned that specimens from Port Jackson, Australia, were in the collections of the British Museum, but that the New Zealand specimens were much more hairy than those from Australia. Many years ago Mr. J. Macmahon sent me numerous specimens that I identified as *S. verrucauda*, which he found boring into soft sandstone on the shores of Kenepuru Sound, and in July, 1910, I found similar specimens in the neighbouring Queen Charlotte Sound, and was able to see for myself beyond doubt that the holes in the sandstone were bored by the *Sphaeroma* and not by a *Teredo;* the holes vary in size from 2 mm. to 7 mm. in diameter, and were occupied by *Sphaeromae* of corresponding sizes, and there was no trace of any *Teredo* in the sandstone.

In 1901 Hedley, in a paper on the "Marine Wood-borers of Australasia," mentions both *S. verrucauda* and *S. quoyana*, the latter having been found boring in wood in Sydney Harbour, and mentions that it hardly differs from *S. verrucauda*. In 1903 I received from Mr. T. Whitelegge specimens of *S. quoyana* from Sydney Harbour, and in forwarding them he said, "*S. quoyana* is identical with specimens from Mr. Thomson's collection labelled '*S. verrucauda*.'" These specimens were some of those that had been handed on by me to Mr. Thomson.

I have now been able to compare specimens from different parts of New Zealand, and also others, labelled "*S. quoyana*," from Victoria and Tasmania, and I quite agree with Mr. Whitelegge that the two species should be united. The species belongs to the same section of *Sphaeroma* as *S. terebrans* Spence Bate and the other species found boring into wood in various parts of the world, and the fact that *S. quoyana* is undoubtedly able to bore into sandstone seems worthy of definite record.

Iais pubescens var. *longistylis* (see above) seems to be regularly associated with *S. quoyana* as a commensal or semiparasite just as the typical form of *I. pubescens* is with *Sphaeroma gigas*.

Exosphaeroma chilensis (Dana).

Sphaeroma chilensis Dana, U.S. Expl. Exped., Crust., p. 177, pl. 52, fig. 3 *a-c*, 1853. *Exosphaeroma chilensis* Chilton, Rec. Cant. Mus., vol. 1, p. 310, 1911.

Three specimens of this species were obtained at the Chatham Islands during the trawling cruise of the "Nora Niven," and are described in my report of the results of that cruise. I had previously had specimens from Lyttelton and Auckland, the latter collected by Mr. Suter.

The occurrence of the species in New Zealand is noteworthy as another addition to the marine species common to New Zealand and to South America.

Livoneca raynaudii Milne-Edwards.

Livoneca raynaudii M.-Edw., Hist. Nat. Crust., vol. 3, 1840, p. 262; Thielemann, Abhand. K. Bayer. Akad. d. Wissensch., 2, Suppl. Bd., 3 Abhand., p. 42, 1910; Chilton, Rec. Cant. Mus., vol. 1, p. 309, 1911.

I have discussed the synonomy of this species, which has so long been known in New Zealand under the name of *L. novae-zealandiae*, in the paper quoted above. The species is widely distributed in southern seas, and Thielemann records it also from Yokohama, adding that it is closely allied to *L. californica* Sch. & M., from the coast of California. *L. epimerias* Richardson, from Japan, also seems to be very closely allied, but, according to Miss Richardson, differs in the shape of the head and the epimera.

Art. XII.—*Report on Sundry Invertebrates from the Kermadec Islands.*

By Professor Benham, D.Sc., F.R.S., Otago University.

[*Read before the Otago Institute, 3rd October, 1911.*]

Mr. Oliver was good enough to hand to me (for the purpose of identification, or description if need be) representatives of various classes of non-vertebrata collected by him during his sojourn on Sunday Island. Unfortunately, my time has not allowed me to touch the *Oligochaeta*, the *Polychaeta*, *Nemertines*, or parasitic worms. In this brief report there are one or two points upon which I have to express uncertainty, owing to the lack of necessary literature; but it seems desirable to present this list, as I do not see any prospect of being in a better position in the immediate future to deal more fully with them.

Class Hydrozoa.

Order Siphonophora.

Physalia utriculus Eschscholtz.

Lesson, Voy. de "Coquille," vol. 2, pt. 2, chap. 15, p. 39; Zoophytes pl. 5, fig. 2. Haeckel, "Challenger" Reports, 28, p. 351.

Cast ashore on Denham Bay, Sunday Island. Widely distributed in the Pacific.